THE WASHINGTON ACCORD AND US LICENSING BOARDS

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ABSTRACT

The Washington Accord known as a Mutual Recognition Agreement between national engineering regulatory bodies was signed in 1989 by six founding signatories. Through this Mutual Recognition Agreement the signatories recognize that the formal educational programmes accredited by the respective signatories are substantially equivalent. The stated objective of the Washington Accord is to ease the path of engineering graduates to professional registration or licencing in different jurisdictions. Since 1989 the signatories to the Washington Accord has increased three-fold with an additional five countries as currently provisional signatories. This rapid expansion is a reflection of the need for international recognition of educational qualifications and competency across borders in an increasingly globalized world. Engineering accreditation bodies, particularly in developing countries are proactively seeking recognition and mobility of their graduates. Within this context, the Washington Accord celebrates 25 years and charts a course for the next 25 years. This paper examines in detail the position of the US licensing boards on the Washington Accord. We conclude that with respect to US licensing boards the Washington Accord has made only modest inroads in its first 25 years and needs to set a much more ambitious path for the next 25 to achieve truly reciprocal mobility.

Keywords: Education & training, Accreditation, Professional Qualifications, Washington Accord

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INTRODUCTION

Prados et al (2005) provided an excellent and concise background to the development of engineering accreditation and professional licensure in the United States. Although the legal regulation of engineering practice dates back to 1907 with the passage of the Wyoming Law, accreditation of engineering programmes in the US is reported only to have really gained momentum after 1929 following the "Wickenden Report". The Engineers' Council for Professional Development (EPCD) was set up in 1932 to implement the recommendations of the Report. This ultimately led to the formation of the Accreditation Board for Engineering and Technology, Inc. (ABET), a non-governmental organization that accredits post-secondary education programs in applied science, computing, engineering, and engineering technology. A comprehensive history of the National Council of Examiners for Engineering and Surveying (NCEES) also covers these aspects of engineering accreditation and professional licensure (NCEES 2004)

Uziak et al (2014) also described accreditation as a fundamental quality assurance mechanism for engineering education and as an important step for international benchmarking and particularly important for graduates of developing countries. Prados et al (2005) examined the role of accreditation in facilitating global professional mobility of engineers and conclude that ABET, through instruments such as; mutual recognition agreements, assistance in the development of leader accreditation processes and systems; and, substantial equivalency evaluations has emerged as a leader in providing a useful framework for evaluating equivalence of diverse engineering credentials.

The International Engineering Alliance (2014a) presented a history (in the interest of brevity not restated here) of the Washington Accord, one of three agreements covering mutual recognition of tertiary-level qualifications in engineering. The Washington Accord recognizes the substantial equivalency of programs accredited by the signatories and recommends that graduates of programs accredited by any of the signatories is recognized by the other signatories. Hanrahan (2014) articulated the stated objective of the Washington Accord by the founding signatories as

> *The founding signatories, convinced that their standards and processes were comparable, agreed to recognise each other's accredited programmes. The objective was to ease the path of graduates to professional registration or licencing in different jurisdictions.*

This objective of the founding signatories of the Washington Accord resonates with the view held by Uziak et al (2014) who asserted that accreditation by any signatory to the Washington Accord guarantees international recognition. However Lucena et al (2008)

previously acknowledged that the increased mobility of engineers creates difficult challenges to country-based systems. Hanrahan (2007) recognized that in several countries, the registering and accrediting bodies are distinct – the United States being one such country. Hanrahan (2007) further asserted that under the Washington Accord, the signatories of such countries undertake to ensure that the separate registering body – in the case of the United States the various licensing boards - accept the accredited programmes of other signatories. Leon H. Clary, P.E., L.S in his President's Report—1995 (NCEES, 2004) elaborates that in many countries education, experience and licensure are under one organization whereas in the United States these are under three organizations. Clary (NCEES, 2004) is of the opinion that the Washington Accord only addresses education and that it is a misconception that the Washington Accord relates in any way to the licensure process.

The founding signatories in 1989 to the Washington Accord were national engineering institutions from Australia, Canada, Ireland, New Zealand, the United Kingdom and the United States. Subsequently additional signatories have been added which include professional institutions from; Hong Kong China, South Africa, Japan, Singapore, Korea, Chinese Taipei, Malaysia, Turkey, Russia with Sri Lanka and India as the new signatories admitted in 2014. There are a number of national institutions with provisional signatory status. Uziak et al (2014) affirmed international recognition is becoming increasingly important for graduates in developing countries which could explain the growing list of signatories to the Washington Accord.

An important point of note is that the UK and Ireland are the only two European signatories to the Washington Accord – a point also emphasized by Prichard (2013).

The National Society of Professional Engineers (NSPE, 2007) presented a lively historical account of the beginnings of licensure – stemming from a water resources and irrigation problem. NSPE (2007) noted that by 1984 all state licensing boards were administering the Fundamentals of Engineering and Principals and Practice of Engineering examinations – a process that NSPE (2007) report started in 1920. This is relevant to this paper because in many ways the current position of the state licensing boards with regards to Mutual Recognition Agreements - including the Washington Accord is similar to the position of state licensing boards to each other's licenses (reciprocity) of the 1920s.

Prados et al (2005) identify as a valid future research question "*How transferable are accreditation criteria and processes across national borders?".* Anwar and Richards (2013) test in-part the research question posed by Prados et al (2005) and report on one particular case at the University of Southampton UK seeking ABET accreditation where educational outocmes and

course duration conflicted. The motivation for the current paper is that as the Washington Accord celebrates its 25 years, (International Engineering Alliance 2014a) this critical discourse is timely and necessary. With more provisional signatories to the Washington Accord awaiting full signatory status it is important that the Washington Accord (and other mutual recognition agreements) is fit for purpose and serve the professional engineering community for the next 25 years taking forward the foresight and vision of the founding signatories. The International Engineering Alliance (2014b) charts the role for Washington Accord's Role for the next 25 years as "*Graduate mobility and recognition through global standards and best practice in accreditation"* hence it is important to understand the constraints to graduate mobility and how these may be overcome.

Phillips et al (2000) described the Washington Accord as a mechanism by which signatories mutually recognize first professional or basic engineering education – although this is debateable in the case of the UK and Ireland signatories as these two signatories have included only their integrated masters (MEng) degrees. Phillips et al (2000) further and quite correctly stated that the licensing and registration bodies are not bound by this agreement. With most signatories of the Washington Accord, the signatory is also the licensing and registration body. However in the US the signatory to the Washington Accord is ABET which is an accreditation body. In the US licensing and registration bodies are US state licensing boards. In this paper the authors expand the scope of Anwar and Richards (2013) and examine in particular the position of each of professional engineering licensing boards in the US to the educational qualifications covered under Washington Accord.

MATERIALS AND METHODS

The methodology adopted in this research is a detailed review of the statutes/rules in fifty two of the professional engineering licensing boards in the US states and territories as listed in Table 1. In addition to this, materials used in this research included, NCEES Model Law and NCEES Model Rules, ASCE Policy Statements, ABET rules, Engineering Alliance documentation (which covers all the Mutual Recognition Agreements including the Washington Accord) and other literature as cited in this research paper.

ANALYSIS

Licensing Board Statutes and Regulations

For professional licensure applicants who hold an ABET accredited undergraduate engineering degree, almost all state licensing boards accept this degree as fulfilling the educational requirements of an "approved degree". For applicants who hold non-ABET

accredited degree (which includes most non-US/foreign degrees), most state licensing boards in this category require that applicants who hold these credentials/qualifications are evaluated by a third party as shown in Table 1. The majority of state licensing boards require applicants to submit their credentials and/or qualifications to the National Council of Examiners for Engineering and Surveying (NCEES) for evaluation. Some state licensing boards do not specify NCEES for evaluation but rather require non-ABET degrees to be evaluated by a board approved organization. A minority of state licensing boards e.g. Arizona Board of Technical Registration, Idaho Board of Licensure of Professional Engineers and Surveyors, North Carolina Board of Examiners for Engineers and Surveyors also accept evaluation of non-ABET accredited credentials/qualifications from evaluation agencies other than NCEES e.g. American Association of Collegiate Registrars and Admissions Officers (AACRAO)

The Illinois Board of Professional Engineers/Department of Financial and Professional Regulation is the sole exception to the rule of universal acceptance of ABET accredited degrees by state licensing board. The Illinois Board states "….*shall take into consideration but not be bound by accreditation by the Accreditation Board for Engineering and Technology*…." although the Illinois rules further state "…..*furthermore upon the recommendation of the Board, has determined that domestic baccalaureate degree engineering programs accredited by the Engineering Accreditation Commission of ABET meet the minimum criteria set forth in subsection (a) for an approved engineering program".* Interestingly Illinois has withdrawn approval for a number of programs from US institutions which have been approved by ABET.

It is noteworthy that the Illinois Board rules state that foreign engineering degrees *approved* by ABET would also need to be evaluated by NCEES. ABET has in the past determined foreign degrees as 'substantially equivalent'. ABET's substantial equivalency programme is obsolete and has been superseded by ABET's international accreditation programme. ABET now undertakes international accreditation of non-US institutions. However ABET does not specifically approve programmes. If the Illinois board use the word approved synonymously with substantial equivalency then Illinois rules seem to require updating. Alternatively, if Illinois board uses the word "approved" synonymously with "accredited" then interestingly the Illinois board draws a distinction between ABET non-US accredited degrees and ABET US accredited degrees. Although perhaps a slightly moot point since ABET has withdrawn its substantial equivalency programme, Illinois Board Rule 38.VIIIb 138.210 c) 3) states

> *The Division, upon the recommendation of the Board, does not recognize ABET "substantially equivalent" programs as meeting the minimum criteria set forth in subsection (a) for an approved engineering program and are, therefore, not approved.*

For foreign engineering degrees, the Board of Professional Engineers, New Hampshire, Rule 303.01 (b) (1) states

> *Applicants possessing a 4-year EAC/ABET equivalent, foreign engineering degree which consists of an engineering program which has a successful ABET site visit shall have 4 years engineering experience satisfactory to the board;*

Rule 303.01 (b) (1) presumably applies to ABET's substantial equivalency programme which is now obsolete and has been superseded by ABET's international accreditation programme. For foreign engineering (non-ABET accredited) graduates the New Hampshire Board Rule 303.01 (b) (5) requires the degree to be evaluated by NCEES and if the degree is deemed favourable, the graduate must then fulfil 8 years of qualifying experience to be eligible for professional licensure. In contrast for graduates of an ABET accredited engineering programme, the requirement is 4 years of qualifying experience. This rule is not unique to the New Hampshire Board alone, rather the majority of state licensing boards require 8 years of qualifying experience for foreign engineering (non-ABET accredited) graduates.

The Pennsylvania State Registration Board for Professional Engineers, Land Surveyors and Geologists Rule 49 § 37.31 a 1 iv) states *Graduation from a foreign undergraduate or graduate, or both, engineering curriculum that was substantially equivalent to an ABET-accredited curriculum, as shown by an evaluation of the candidate's credentials by NCEES's credentials evaluation division.* It is interesting to note that although the Washington Accord's very purpose is to establish substantial equivalency of programmes accredited by the signatories, the Pennsylvania Board as with most other licensing board still require the credentials to be evaluated by NCEES.

The Tennessee Board of Architectural and Engineering Examiners accepts undergraduate engineering degrees accredited by ABET or those that have been determined to be substantially equivalent to an ABET accredited degree. Again this refers to the now obsolete ABET substantial equivalency programme.

Only a very small number of state licensing boards explicitly acknowledge the Washington Accord in their statutes and rules. State licensing boards that fall into this category are the; Texas Board of Professional Engineers, the Idaho Board of Licensure of Professional Engineers and Professional Land Surveyors and, South Carolina Department of Labor, Licensing and Regulation. This minority group of licensing boards considers any degree covered by the Washington Accord as an acceptable qualification towards the educational eligibility requirements for licensure.

This throws up a unique anomaly with respect to the European signatories namely the UK and Ireland, of the Washington Accord. Anwar and Richards (2013) established that for the

UK only MEng degrees are covered under the Washington Accord, UK BEng degrees are not recognized by the Washington Accord, this was restated by Prichard (2013) who as Chief Executive Officer of the Engineering Council (UK) is a significant authority on the subject. Engineers Ireland the second European signatory to the Washington Accord explicitly state that "…..*programmes listed under Chartered Engineer meet the Washington Accord*….." , Engineers Ireland (2014). For Ireland just as with the UK, programmes that meet the educational requirements for a Chartered Engineer and hence the Washington Accord are master level programmes known colloquially as MEng programmes. Hence by inference, the Texas, Idaho and South Carolina Boards will only accept European MEng degrees as an acceptable qualifications towards the eligibility requirements for licensure. This is reinforced by the fact that many state licensing boards require an undergraduate engineering curriculum to be of 4 years in duration, and also that ABET require an engineering degree to be 4 years in duration, (ABET 2011). These licensing boards do not give credit for the UK master level qualification beyond that of the US Bachelors qualification i.e. they are considered on par. In contrast, most licensing boards explicitly give credit (in the form of reducing work experience requirements) to candidates who hold an ABET accredited master degree. The anomaly of UK engineering degrees and the Washington Accord is even more complicated with engineering bachelor degrees from Scotland. Although Scotland is part of the UK an engineering bachelor degree in Scotland is four years in duration as opposed to the three year duration in England and Wales. However as the signatory to the Washington Accord the UK Engineering Council which represents the entire UK (which includes Scotland), hence engineering bachelor degrees from Scotland are also not recognized by ABET under the Accord. With all other (non-European) Washington Accord signatories, it is the bachelor qualifications that are considered comparable to the US bachelor qualification and as acceptable qualifications towards the eligibility requirements for licensure.

The Minnesota Administrative Rules (2014) do not make explicit reference to the Washington Accord, but a UK Chartered Engineer (CEng) under Rule 1800.2800 (B) would be exempt from the requirement of passing the Fundamentals-of-Engineering (FE) Examination. The New Mexico (NM) Board of Licensure for Professional Engineers & Professional Surveyors does not recognize any mutual recognition agreements. Under the 2012 NM Engineering and Surveying Practice Act - Section 61-23-14.1, an engineer licensed in a foreign country who can demonstrate the license was obtained based on standards at least equal to that those required by the 2012 NM Engineering and Surveying Practice Act, and can demonstrate competence may be licensed by endorsement. The North Dakota State Board of Registration for Professional Engineers & Land Surveyors, Iowa Professional Licensing Bureau and Rhode Island State

Division of Design Professionals, have a similar position on engineers with registration to practice in a foreign (non-US) country to that of the New Mexico.

A number of licensing boards recognize degrees accredited by the Canadian Engineering Accreditation Board as fulfilling the educational requirements for professional licensure. The Illinois Board recognizes the "…..*Mutual Recognition Program agreement between ABET and the Canadian Engineering Accrediting Board (CEAB) of the Canadian Council of Professional Engineers (CCPE) is considered to have met the minimum criteria as equivalent to the ABET accredited programs and are, therefore, approved, subject to review*." The Illinois Board does not explicitly recognize the Washington Accord. The Mississippi Board, South Carolina Board, South Dakota Board, Utah Division of Occupational and Professional Licensing have a similar position on programmes accredited by the Canadian Engineering Accrediting Board to the Illinois Board. This is noteworthy because Canada is a signatory of the Washington Accord, hence degrees accredited by Engineers Canada are recognized by US licensing boards either by explicit reference in board rules and statutes and additionally where applicable by recognition of the Washington Accord. It is also interesting to note that there are more state licensing boards that acknowledge the Canadian Engineering Accreditation Board rather than the Washington Accord.

NCEES Model Law and Model Rule and ASCE Policy Statement 465

The stated aim of the NCEES Model Law (NCEES 2013a) is to assist legislative counsels in preparing new laws or amendments to existing laws. The proportion of the NCEES Model Law that is adapted into state licensing board statutes varies and is difficult to quantify. Some state licensing boards have adopted verbatim sections from the NCEES Model Law, whereas others paraphrase the NCEES Model Law. What is clear however is that the NCEES Model Law does bear significant influence on state licensing board statutes. The Model Law makes no reference to the Washington Accord or indeed any Mutual Recognition Agreement. NCEES Model Rules (NCEES 2013b) 230.10.A.2 only refers to foreign qualifications deemed substantially equivalent by the licensing board to an EAC/ABET accredited degree. As we have discussed in the previous paragraph, most licensing boards delegate the task of establishing equivalency to the NCEES Credentials Evaluation service.

As the Washington Accord looks towards the next 25 years, the Accord needs to be cognizant of the implications of ASCE Policy Statement 465 (ASCE 2014b) which states that the *….attainment of an engineering body of knowledge for entry into the practice of engineering at the professional level, i.e., practice as a licensed professional engineer, through appropriate engineering education and experience…… which would require a combination of:*

- *a baccalaureate degree in engineering;*
- *a master's degree in engineering,……*

The recommended time frame stated by ASCE Policy Statement 465 for this 'raising the bar' is no earlier than 2020. The NCEES Model Law (NCEES 2013a) also incorporates the requirement of a candidate seeking professional licensure to have an engineering master level qualification. Although the NCEES Model Law recommends this law to come into effect from January 1, 2020 the footnote acknowledges that the implementation may vary between jurisdictions and recommend an eight year period for implementation. The implementation of Policy Statement 465 into licensure statutes is by no means a foregone conclusion. Walker (2012) describes there are two cultures of engineering – the professional independence interest versus the business interest with strong arguments presented by the proponents and opponents. Richards et al (2011) examines the sentiments of business owners, university professors and state licensing boards towards ASCE Policy Statement 465. Importantly in the context of this paper is the sentiment of licensing boards towards Policy Statement 465 and Richards et al (2011) find that 46% of state licensing board chairs' support and 38% oppose ASCE Policy Statement 465 – with 16% undecided. The support from licensing board chairs is lower that of academic leaders at 60%, but higher than that of American Council of Engineering Companies (business leaders) at 16%. Hence whether or not ASCE Policy Statement 465 finds its way into the statutes of state licensing boards remains an open question.

ASCE Policy Statement 465 may not pose a particular problem for most European masters degrees. In fact at the time of writing this paper three institutions in Spain and one in Germany hold ABET accredited engineering master programmes. Hence it can be envisaged that the Washington Accord could be amended to cover the European engineering master degree – however the issue of European bachelor degree described earlier remains. ASCE Policy Statement 465 may pose a challenge for the UK and Ireland where an engineering master programme is one calendar year (3 semesters in duration) rather than more typical two academic years (4 semesters). ASCE Policy Statement 465 qualifies the requirement of a master degree as no less than 30 credits. In the UK a typical engineering master degree is 90 ECTS (European Credit and Transfer System). Hence the debate could become one of conversion between these two credit systems.

Conclusions and Recommendations

This research paper shows that despite 25 years of the Washington Accord, the majority of state licensing boards in the USA do not explicitly acknowledge mutual recognition

agreements entered into by the various national bodies responsible for accrediting national engineering degree programmes. In the US almost without exception, all state licensing boards require any engineer with a non-US engineering degree to obtain evaluation of their degree. The agency of choice for most state licensing boards for the evaluation of foreign (non-US) credentials is the NCEES.

A small minority of state licensing boards do acknowledge the Washington Accord and accept an engineering degree obtained from a Washington Accord signatory country as fulfilling the educational requirements towards professional licensure. This in fact is the starting point for signatories of the Washington Accord, if this accord is to be relevant and a useful instrument that (paraphrasing from the objective stated by the founding signatories) *is to ease the path of graduates to professional registration or licencing in different jurisdictions*. The signatories of the Washington Accord need to use as exemplars to the Texas Board of Professional Engineers, Idaho Board of Licensure of Professional Engineers and Professional Land Surveyors and South Carolina State Board of Registration for Professional Engineers and Surveyors for other state licensing boards to recognize the Washington Accord and include it in their statutes/rules. Another exemplar is the Illinois Board of Professional Engineers/Department of Financial and Professional Regulation which also recognizes a Mutual Recognition Agreement – albeit that between ABET and the Canadian Engineering Accrediting Board (CEAB). A "low-hanging fruit" for the signatories of the Washington Accord would hence be the Illinois Board. Here it would be a case of making a case that the Illinois Board include a second Mutual Recognition Agreement – namely the Washington Accord in its rules. In addition the signatories of the Washington Accord should seek to include reference to this Accord (and possibly other Mutual Recognition Agreements) into the NCEES Model Law and Model Rules.

For the European signatories of the Washington Accord namely; UK and Ireland there is an additional challenge as the Bachelor (BEng) degree is specifically excluded from the Washington Accord. Interestingly should Scotland have achieved independence following a positive endorsement of the referendum on this question, Scotland's four year engineering bachelor degree would fulfil the ABET requirements with educational outcomes being substantially similar to engineering bachelor degree from England, Wales and Northern Ireland. As it stands for the UK, the Washington Accord only recognizes the integrated master (MEng) degree. The ABET website states (ABET 2014a) *Graduates of programs based in the United Kingdom and Russia: Please email ABET's International Relations Manager to determine if the program you graduated from is recognized by the Washington Accord*, whereas for almost all other signatory countries a simple checklist is provided. This lack of clarity does not sit comfortably with the role identified for the

Washington Accord over the next 25 years of graduate mobility and recognition. Based on the evidence presented in this paper, the authors are of the opinion that the impasse here is that European bachelor degrees are of 3-year duration whereas outside of Europe (including the US) bachelor degrees are of 4-year duration. Perhaps then the only solution is for a European engineering graduate is to accept that a European bachelor degree in engineering does not fulfil the educational requirements towards professional licensure in the US and such graduates should expect to take additional courses/credits.

The signatories to the Washington Accord need have contingency plans should the minimum educational requirement for licensure become a master of engineering degree enter the statues of licensing boards in 2020 or thereafter. The International Engineering Alliance need to be cognizant of a fast changing world in which individual institutions are becoming more international and may overtake the International Engineering Alliance. Since ABET started offering accreditation services outside the United States in 2007, 365 academic programs at 72 institutions in 23 other nations have achieved ABET accreditation. NCEES has changed the Fundamentals of Engineering examination to a computer based test delivered through Pearson VUE test centers. NCEES offers examinations internationally in; Canada, Egypt; Sharjah; Japan; Korea; Saudi Arabia and Turkey. Furthermore Saudia Arabia rather than becoming a signatory to any Mutual Recognition Agreement for its own territorial degrees has adopted the US model of ABET Accreditation and PE licensure. It is in this fast moving environment that the International Engineering Alliance needs to ensure that its instruments such as Mutual Recognition Agreements remain relevant. The alternative model is that institutions from signatory countries such as Engineers Canada 'go-it-alone' and obtain explicit recognition in state licensing boards and statutes which would certainly render mutual recognition agreements less relevant in the US.

References

ABET (2011) Pers communication to Dr Alan Bloodworth, University of Southampton, Southampton UK date July 7, 2011.

ABET (2014a) ABET website http://www.abet.org/recognized-by-washington-accord/ accessed August 20, 2014.

ASCE (2014b) ASCE website http://www.asce.org/issues-and-advocacy/public-policy/policy-statement-465---academic-prerequisites-for-licensure-and-professional-practice/accessed Dec. 16, 2014

Anwar A.A. and Richards D.J. (2013) "Is the USA set to dominate accreditation of engineering education and professional qualifications?" Proceedings of the Institution of Civil Engineers. Civil Engineering 166; CE1, 42–48.

Engineers Ireland (2014) http://www.engineersireland.ie/services/accredited-courses/chartered-engineer.aspx accessed Aug.17, 2014.

Hanrahan H. (2007) "The Washington Accord: History, Development, Status and Trajectory"

Hanrahan H. (2014) "Dr Hu Hanrahan's Speech Notes at Washington Accord Dinner" http://www.ieagreements.org/25_years/, accessed Aug. 16, 2014.

International Engineering Alliance (2014a) "25 years Washington Accord" http://www.ieagreements.org/25_years/, accessed Aug. 16, 2014.

International Engineering Alliance (2014b) "Powerpoint Presented at the 25 Years Washington Accord Dinner" http://www.ieagreements.org/25_years/, accessed Aug. 16, 2014.

Lucena J. , Downey G, Jesiek B. and Elber S. (2008) "Competencies beyond countries: the reo-organization of engineering education in the United States, Europe and Latin America". Journal of Engineering Educatoin 94(4), 433-337.

Minnesota Administrative Rules (2014) https://www.revisor.mn.gov/rules/?id=1800&view=chapter#rule.1800.2800 accessed Aug. 17, 2014.

NCEES (2004) "The History of the National Council of Examiners for Engineering and Surveying" NCEES, Third Ed. edited by Joanna Acorn Corley.

NCEES (2013a) "Model Law" http://cdn3.ncees.co/wp-content/uploads/2012/11/Model-Law-2013.pdf accessed Sep., 20, 2014.

NCEES (2013b) "Model Rules" http://cdn3.ncees.co/wp-content/uploads/2012/11/Model-Rules-2013.pdf accessed Sep., 20, 2014.

NSPE (2007) "Century" Professional Engineer June 2007p. http://www.nspe.org/sites/default/files/resources/pdfs/pemagazine/june2007_the_professional_engineering.pdf accessed Sep. 05, 2014.

Phillips WM, Peterson GD and Aberle KB (2000) "Quality assurance for engineering education in a changing world." International Journal of Engineering Education 16(2): 97–103.

Prados J.W., Peterson G.D. and Lattuca L.R. (2005) Quality Assurance of Engineering Education through Accreditation: The Impact of Engineering Criteria 2000 and Its Global Influence. J. of Engng. Educ., ,94(1) 165-183

Prichard J. (2013) "Discussion to 'Is the USA set to dominate accreditation of engineering education and professional qualifications?" Proceedings of the Institution of Civil Engineers, Civil Engineering, 166; CE2: 56.

Richards P.W., Williams G., Schultz G.G. and Nelson E.J. (2011) "Present sentiment about ASCE Policty Statement 465 amongs Business Owners, University Professors and State Licensing Boards".

Uziak, J., Oladiran, M., Walczak, M., and Gizejowski, M. (2014) "Is Accreditation an Opportunity for Positive Change or a Mirage?." J. Prof. Issues Eng. Educ. Pract., ASCE, 140(1), 02513001.

Walker H.W. (2012) " Policy 465: Latest Struggle in the 'Revolt of the Engineers'" J. Prof. Issues in Eng. Educ. Pract., ASCE, 138:283-288

Table 1: Professional Engineering Boards reviewed

	US state or territory	Non-US educational qualification
1	Alabama	NCEES evaluation
2	Alaska	Not specified
3	Arizona	NCEES evaluation and others
4	Arkansas	Not specified
5	California	NCEES evaluation
6	Colorado	Not specified
7	Connecticut	NCEES evaluation
8	Delaware	Board evaluation
9	District of Columbia	NCEES evaluation
10	Florida	NCEES, Joseph Silny & Associates evaluation
11	Georgia	NCEES evaluation
12	Guam	NCEES evaluation
13	Hawaii	Board evaluation
14	Idaho	NCEES, AACRAO evaluation
15	Illinois	NCEES evaluation
16	Indiana	NCEES evaluation
17	Iowa	Board evaluation
18	Kansas	Evaluate by Board approved organization
19	Kentucky	NCEES evaluation
20	Louisiana	Board approved organization
21	Maine	NCEES evaluation
22	Maryland	Evaluate by Board approved organization
23	Massachusetts	NCEES evaluation
24	Michigan	Board evaluation
25	Minnesota	NCEES evaluation
26	Mississippi	NCEES evaluation
27	Missouri	Not specified
28	Montana	Evaluate by Board approved organization
29	Nebraska	NCEES evaluation
30	Nevada	NCEES evaluation
31	New Hampshire	NCEES evaluation
32	New Jersey	Not specified
33	New Mexico	Board evaluation
34	New York	Board evaluation
35	North Carolina	NCEES, AACRAO
36	North Dakota	Board evaluation
37	Ohio	NCEES evaluation
38	Oklahoma	NCEES evaluation
39	Oregon	NCEES evaluation
40	Pennsylvania	NCEES evaluation
41	Puerto Rico*	
42	Rhode Island	Board evaluation
43	South Carolina	Board evaluation
44	South Dakota	NCEES evaluation
45	Tennessee	Evaluate by Board approved organization
46	Texas	Evaluate by Board approved organization
47	Utah	NCEES evaluation

48	Vermont	NCEES evaluation
49	Virginia	Board evaluation
50	Virgin Islands	Board evaluation
51	Washington	NCEES evaluation
52	West Virginia	Evaluate by Board approved organization
53	Wisconsin	Board evaluation
54	Wyoming	NCEES evaluation